

IN THE CLAIMS

LISTING OF CLAIMS

Following is a listing of all claims in the present application, which listing supersedes all previously presented claims:

1. (Original) An apparatus for supplying a chemical solution to a chemical injection part in a semiconductor manufacturing process, comprising:

a chemical solution supply source;

a feed line in which the chemical solution is supplied from the chemical solution supply source to the chemical solution injection part using a pressure of the chemical solution supply source; and

means for measuring/controlling a flow rate of the supplied chemical solution, the measuring/controlling means being mounted in the feed line,

wherein the feed line comprises:

a recycle line for preventing coagulation of the chemical solution, the recycle line being connected to the chemical solution supply source; and

a branch line branching from the recycle line, the branch line being connected to the chemical solution injection part, and

wherein the means for measuring/controlling the flow rate of the supplied chemical solution comprises:

a flow rate control valve;

a detector for detecting the flow rate of the chemical solution and generating a flow rate data signal, the detector being mounted in the feed line of the flow rate control valve; and

a controller for receiving the flow rate data signal and comparing the flow rate data signal with a reference flow rate data signal in order to output a control signal for controlling a degree of opening the flow rate control valve.

2. (Original) An apparatus as claimed in claim 1, wherein the controller comprises a proportional integral derivative (PID) automatic controller.
3. (Original) An apparatus as claimed in claim 1, wherein the controller further comprises a display device for displaying the measured flow rate and an alarm device for warning an operator that the measured flow rate is different from a required flow rate.
4. (Original) An apparatus as claimed in claim 1, wherein the chemical injection part is included in a polishing apparatus having a rotate-able turntable and a polishing pad.
5. (Original) An apparatus as claimed in claim 1, wherein the chemical solution is a slurry comprising one or more from the group consisting of a reaction reagent, friction particles, and a chemical reaction catalyst.

6. (Currently Amended) An apparatus for supplying a chemical solution to a chemical injection part in a semiconductor manufacturing process, comprising:

a plurality of chemical solution supply sources, each source supplying a different chemical solution;

a plurality of feed lines into which the chemical solutions are injected from the chemical solution supply sources to the chemical injection part by a pressure of the chemical solution supply sources, each one of the plurality of feed lines having a recycle line for preventing coagulation of the chemical solution, the recycle line being connected to an associated chemical solution supply source, and having a branch line branching from the recycle line, the branch line being connected to an associated chemical solution injection part; and

a means for measuring/controlling flow rates of the chemical solutions supplied to the chemical solution injection part, the means for measuring/controlling flow rates being mounted in each of the feed lines

~~wherein each of the plurality of feed lines further comprises~~

~~a recycle line for preventing coagulation of the chemical solution, the recycle line being connected to an associated chemical solution supply source; and~~

~~a branch line branching from the recycle line, the branch line being connected to an associated chemical solution injection part.~~

7. (Original) An apparatus as claimed in claim 6, wherein the chemical solutions are mixed with each other just before being supplied to the chemical solution injection part.

8. (Cancelled)

9. (Original) An apparatus as claimed in claim 6, wherein the branch lines of each one of the plurality of feed lines are coupled by a coupling part to a single line just before supplying the chemical solutions to the chemical solution injection part, and

wherein the coupling part is adjacent the chemical solution injection part.

10. (Amended) An apparatus as claimed in claim 8 6, further comprising a mixer for mixing the chemical solutions with each other, the mixer being installed at the coupling part.

11. (Original) An apparatus as claimed in claim 6, wherein each one of the plurality of chemical solutions comprises one or more from the group consisting of a polishing agent, a chemical additive mixed with the polishing agent, and de-ionized (DI) water.

12. (Original) An apparatus as claimed in claim 6, wherein each of the measuring/controlling means comprises:

a flow rate control valve;

a detector for detecting the flow rate of the associated chemical solution, the detector being mounted in the feed line of the flow rate control valve; and

a controller for receiving a flow rate data signal and comparing the flow rate data signal with reference flow rate data signal in order to output a control signal for controlling a degree of opening the flow rate control valve.

13. (Original) An apparatus as claimed in claim 12, wherein the controller comprises a proportional integral derivative (PID) automatic controller.

14. (Original) An apparatus as claimed in claim 12, wherein each one of the controllers further comprises a display device for displaying the measured flow rate and an alarm device for warning an operator that the measured flow rate is different from a required flow rate.

15. (Original) An apparatus as claimed in claim 6, wherein the chemical solution injection part is included in a polishing apparatus having a rotate-able turntable and a polishing pad.

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)